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Teaching a Humanities Course: A Mathematician's View

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ABSTRACT

When asked by a number of my friends in academe about what I am doing these days, I tell them that I am now into my third academic career: first, a mathematician; second, a computer scientist; and, third, a budding humanities instructor. During the fall of 1998 I had the opportunity to teach a first-semester section of a new two-semester Core sequence in the humanities which has become part of the General Education Program at Valparaiso University. In what follows I intend to give you some idea of what it was like for me, an outsider to the humanities' disciplines, to teach such a course. I will describe some of my thoughts about what made the experience worthwhile and what were the difficulties. Also, I will offer some reflections on how this experience has helped me, both to think more carefully about the humanistic dimensions of mathematics and to address the issue of teaching mathematics humanistically.

INTRODUCTION

First, some background information. Valparaiso University (VU) is a comprehensive, national university in the Lutheran tradition with a total of around 3 800 students. Within the University there are four undergraduate colleges (Arts and Sciences, Business Administration, Engineering and Nursing), a Law School and a modest graduate program. For the past eighteen years students in their first year of study took specifically designated courses in English, History, Theology and a Freshman Seminar. Beginning with the 1998-9 academic year this twelve-credit Freshman Studies program has been replaced by two five-credit courses taken over both semesters.

In the Core, as it has become known, all new students read the same texts and study the same material at approximately the same time, all in sections of about 20. (See the Appendix for a list of the required texts and readings for the first semester.)

This ambitious project has rather ambitious goals:

1. to initiate the students into academic study and the VU academic community through a sustained conversation about important aspects of human experience;
2. to encourage careful reflection and better understanding of our lives together;
3. to develop the students' ability and encourage habits of skilled writing, critical thinking, careful analysis and interpretation of texts, and persuasive presentation of ideas.

Since the theme focuses on "common" human experiences, six sub-themes are examined: birth and creation, coming of age and education, citizenship and service, love, work and play, and loss and dying; the first three provide a framework for the material covered in the first semester. To help the students reflect on various aspects of each of these life experiences, they are required to read specific texts and to come to class prepared to participate in a conversation with their peers, with their instructor and with the text itself. In addition to the in-class dialogue, further reflection takes place through extensive writing assignments—in the first semester there were five papers to be written, a reading journal to be kept and a writing portfolio to be developed. Attendance at certain out-of-class activities, such as films, plays, lectures and musical events, is required to help broaden the students' own life experiences.

You might wonder how it happened that I, a mathematician/computer scientist, found myself teaching this first-time offering of the first semester of the Core. At times during the summer of preparation, when I was seized with a fit of anxiety, I asked myself this very question. It certainly wasn't because I'm a thrill-seeker nor because "it was there." It happened, as is usually the case, for a mix of reasons. Idealistically, I wanted to reintroduce myself in a systematic way to conversations which occur regularly in the study of the liberal arts. After all, eight years of Jesuit schooling in high school and college had awakened my curiosity to the possibility of such conversations. Practically, someone from my department "had" to do it since the call had gone out to all areas of the University to participate. Never one to shy away from try-

ing something new, I volunteered my services.

SUMMER OF PREPARATION

Once I had committed myself in early May 1998 to being one of the instructors for the start-up version of the Core, I quickly realized that I would need to devote much of the summer to study and preparation for what seemed to me to be a rather daunting task ahead. I began to think about some basic questions, such as how does one teach writing? How does one teach texts in the humanities? What adjustments to my teaching style will I need to make to facilitate classroom discussion about the texts? What type of background material do I need to learn and do my students need to know so that the discussions are meaningful and become more than just a sharing of ignorances?

Having the entire summer to get ready helped immensely. There was sufficient time to read all of the fall semester's required texts and readings in a leisurely manner. I even reread a couple of the novels while communing with nature and with friends on an island retreat in the northern part of Lake of the Woods in Ontario, Canada.

In addition, two workshops covering a total of nine days-four in the latter part of May and five in the middle of August—were organized by the Core Director to bring all of the Core faculty together to wrestle with some of the very same issues about which I had been concerned. (It was nice to find out that I wasn't the only one feeling like a fish out of water.) In the May sessions our conversations dealt principally with writing as a means to learning. There was also time set aside to organize ourselves into six cohort groups, each one of which would be responsible for preparing curricular materials, including developing a daily syllabus, related to one of the sub-themes. I was placed in the "Coming of Age and Education" cohort. The August sessions were devoted to pounding out a daily syllabus for the entire year and to providing guidance on many of the how and what questions.

MY EXPERIENCE

What can I say about the experience of teaching in the Core? The short answer is it was challenging, intellectually exciting, scary, quite difficult at times, and, yes, fun. However, in order for me to do justice to this question I feel obliged to elaborate—first, some perspective gained during the first few weeks of the course which helped carry me through the semester and, then, some specific examples which illustrate some of the pedagogic techniques I learned from my colleagues in the humanities to help me to teach a discussion-based course focused on works of literature.

Insights

One, I realized that as a mathematician and a teacher/scholar, I am not without my own resources. I know how to learn. I know how to read carefully. I know how to carry on a conversation about what I have read. I know how to raise questions about that which I don't understand. Having written articles previously for a variety of audiences, including readers of VU's literary periodical, I do know something about the process of writing. And, since much has changed in the way we in the undergraduate community teach mathematics these days, I am not uncomfortable in a classroom situation where lecturing is not the main mode of aiding student learning. The knowledge that each day in class I had something to bring to the table increased my confidence in my ability to work with students in this new environment.

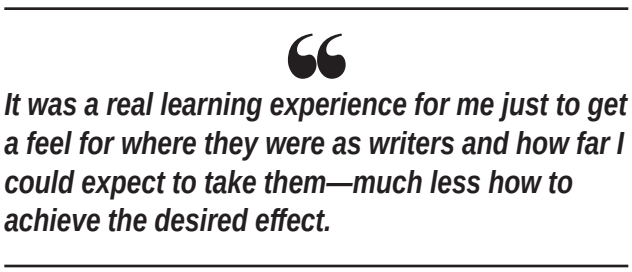
Two, most 18-year old college students who attend a place such as Valparaiso University have some experience with reading good literature in high school and expressing their thoughts in writing about what they have read, neither of which they seemed to dislike. This situation lends itself to a nice start to the course. However, their view of the world is quite different from those of us who came of age in the '60s, and their experiences of the world are limited as compared to our own. (I'm sure that this comes as no surprise to those who have taught first-year humanities courses in recent years.) Hence, although these new students were eager to learn more about their world, it began to dawn on me that one of my roles as their instructor was to help them see how and why the texts and readings we had chosen for them to read could contribute to their own understanding of their place in the world. It was one of those "aha moments" when I realized that teaching works of literature involves struggling with issues about life experiences.

Specifics

One, early on I struggled with focusing the students' attention at the beginning of class on what they had

read the night before. For the first couple of weeks I would ask students to respond to some of the guiding questions which were part of the daily syllabus. However, on some days all I got were those blank stares with which we are all familiar. I raised the issue with colleagues at one of our weekly cohort meetings and received the following suggestion: begin each class day with a short writing assignment in which the students would be asked to respond in their writing journals to a question I would pose about the current reading assignment; then, ask for some volunteers to read aloud what they had written. It was amazing to me to see how well this method helped to set a tone for discussions that followed.

Two, especially during the first few weeks of the course, finding a proper balance between my role as the instructor, providing sufficient context for the students to understand what they had read, and my role as a moderator, facilitating the discussion so that the students-all the students-could contribute their insights to the issues being raised was a real challenge. For example, to appreciate better Toni Morrison's first major novel, "The Bluest Eye," it is helpful for the reader to have some understanding not only of the historical, philosophical and cultural background out of which she wrote but also some contextual background of the time about which she wrote. For me one of the difficulties was how to provide my students with that information without telling them of Ms. Morrison's intent in writing the novel, nor even laying out the issues she was raising.



It was a real learning experience for me just to get a feel for where they were as writers and how far I could expect to take them—much less how to achieve the desired effect.

One approach (which met with partial success) to resolving this dilemma was to use the first day (of the three to five set aside for reading and discussing a text) for background, and then, on the remaining days, to divide up the class into small groups either to respond to the guiding questions included in the syllabus or to dissect some particularly meaningful and rich passages in the text.

Three, it took me the entire semester and then some to develop a sense of how I could help my students become better writers. It was a real learning experience for me just to get a feel for where they were as writers and how far I could expect to take them—much less how to achieve the desired effect. Based on my own observations and on discussions with my colleagues in the Core, I now understand that for writing assignments outside of class I need to articulate more clearly my expectations, to have more in-class discussions about the process of writing, to provide models of good writing by first-year students, to be more consistent in evaluating what they have written and to offer more reflective criticism of their work.

EFFECTS ON THE TEACHING OF MATHEMATICS

In a letter [3] summarizing the conclusions reached by the participants in the initial 1986 Humanistic Mathematics Conference, Alvin White describes "two related themes that emerged from the conference, one, teaching mathematics humanistically and, two, teaching humanistic mathematics." While on sabbatical this Spring semester (1999), I have had the luxury of time to think about these issues more carefully, especially just after having the experience of teaching a course in the humanities. Having taught only one humanities course one time, I will not be so bold as to give a definitive answer to the more philosophical question of whether mathematics is a humanistic discipline. (A very tentative answer would be, no, if by humanistic discipline we mean the system of study in which human interests, values and dignity are taken to be of primary importance [2]. The answer might be more affirming if by humanistic mathematics we are referring to humanizing this systematic study by paying more attention to its historical growth, philosophical underpinnings and regional applications.) However, fortuitously the time was right for me to give some thought to how some of the experiences I have had might inform my own teaching of mathematics.

It turns out that my teaching in the Core coincides with a realization on my part that some of the pedagogic tools I have used no longer seem to be as successful as they once were in helping students become better learners of mathematics. For example, one of the techniques I have employed for the past ten

years in almost all mathematics courses is something I call same-day quizzes. In order to focus students' attention the night before on material they have been assigned to read and problems they have been asked to work out for the next class period-for the most part, new material and problems whose solutions or solution-types have not yet been introduced in class-I make it known from day one that they should be prepared daily to take a quiz in the last ten minutes of class. The quiz consists of one or two of the homework problems. In theory, having the quiz at the end of the class period gives the students sufficient time to ask questions either before class or during class about that which they don't understand. In practice, one of the difficulties with this approach has been that, especially in lower-division math classes, there are too many students who struggle with the material the night before class to such an extent that they either give up out of frustration or come to class completely confused. For these students the class time before the quiz is unproductive, and they are no better prepared to do well on the quiz than they were before they came to class. To say the least, this situation is not conducive to providing a healthy learning environment.

So, what have I learned from teaching a discussion-based, intensive writing course about literary works which might carry over to the teaching of mathematics? First of all, carefully constructed writing assignments both inside and outside the classroom can be valuable aids to learning in that the process of writing can help clarify in the writer's mind ideas and concepts which at first appear to be rather fuzzy. Precision about the meaning of what one has read is important both in literature and in mathematics. In addition, articulating on paper what one understands about a problem and its solution can lead one to making connections with what has come before. And, as we all have experienced, mathematics is much about observation, patterns and making connections.

Second, group work assignments, if carefully crafted and monitored, can add to the process of learning. (This just confirms what I have found from assigning certain types of software design projects as team projects to my students in computer science courses.) Some of the same benefits as with writing can accrue to the learner since struggling to articulate to others in the group what one does and does not understand can lead to clarity. An additional benefit can come from the dynamics inherent in a group, namely, through the process of discussion different approaches can be brought to bear on a problem and its solution. Hence, insights that one might never have had when working alone can emerge.

For a number of you the observations in the previous two paragraphs are not new. Some of you have been using writing and group work in the mathematics classroom for some time. (See [1] for a sample of the many innovative ideas that currently are being implemented around the country.) Yet, there is much we can learn from discussions with our colleagues in the humanities about teaching humanistically.

But, what effect will all of this have on my teaching of mathematics in the immediate future? This coming fall semester one of the courses I will be teaching is a section of Finite Mathematics which we offer mainly to business and social science majors. It is a typical Finite course in which the problems to be solved involve discrete quantitative data; the solutions of which usually require some understanding of mathematical modeling and the mathematical tools appropriate to solve the model. It has been my intention for the past year that come fall I want to explore how spreadsheets might enhance students' understanding of the material in this course, possibly via outside of class lab assignments. I now have a better idea as to how I might incorporate both writing and group work into the lab environment. In addition, I plan to introduce short writing assignments in the first few minutes of class to get a feel for what the students have understood from the nightly homework assignment. That way, on any given day there will be either a writing assignment at the beginning of the class or a quiz at the end of class.

CONCLUSION

My experience in teaching the first semester of our new two-semester Core sequence was definitely worthwhile. As a matter of fact, I am looking forward to teaching the entire sequence this coming academic year (1999-2000). The benefits of working with colleagues from across campus in a shared experience which is centered on reading great literature with an eye toward helping students reflect on what they have read and articulate what they have experienced far outweigh the costs in time and energy for an "outsider" to get up to speed. A bonus is that it provides

me with an opportunity to reflect on my role as a teacher of mathematics. An added bonus is that I now have a larger group of colleagues to whom I can turn for assistance with my own writing. (Two of my Core colleagues in the English Department have reviewed various drafts of this paper.)

I have had to work harder than I have in years to provide the students with an enriching experience, but in the process I have been intellectually stimulated by taking on such a challenge.

REFERENCES

1. Gold, B., Keith, S. & Marion, B. (Co-editors), "Assessment Practices in Undergraduate Mathematics," MAA Notes Series #49, Mathematical Association of America, 1999.
2. *Random House Unabridged Dictionary* (2nd ed.), Random House Inc., 1993.
3. White, A., "From Newsletter #1," *Humanistic Mathematics Network Journal*, Issue #18, Nov. 1998.

APPENDIX: FALL SEMESTER TEXTS AND READINGS

Required Texts

My Antonia by Willa Cather
Gilgamesh translated by David Ferry
The Bible, New Revised Standard Version
Frankenstein by Mary Shelley
Little Women by Louisa May Alcott
The Bluest Eye by Toni Morrison
Confessions (Books I-IX) by St. Augustine
Hunger of Memory by Richard Rodriguez
Antigone by Sophocles
Lest Innocent Blood Be Shed by Philip Hallie
The Bedford Handbook by Marilyn Hacker

Required Readings

Selected Poems by Anne Bradstreet
On Liberty (Chapter 4) by John Stuart Mill
Mencius (Selections)
The Book of Lord Shang
"Letter from Birmingham City Jail" by Martin Luther King Jr.
"The Courage To Stand Alone" by Wei Jingshen

Word Problems

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(may be sung to the tune of Billy Joel's "We Didn't Start the Fire")

Words in problems bother me,
I'd like to drown them in the sea.
My brain is numb, I feel so dumb
I can't tell x from z.
Numbers swim within my brain, those methods used seem so arcane
How can I remember d is equal to rt?
Seems my work is never done,
Teach assigned another one,
This weirdo claims they're lots of fun,
How I wish I had a gun,
I'd have that joker on the run.
I can't solve word problems.
They're a pain to me
The answers I can't see.
If I have to to work one now,
My mood will fluctuate
From love to hate to hate to hate...